



Sun-3/80 Main Memory Expansion

Module Installation Manual





Sun-3/80 Main Memory Expansion Module Installation Manual



The Sun logo, Sun Microsystems, and Sun Workstation are registered trademarks of Sun Microsystems, Inc.

Sun, Sun-2, Sun-3, Sun-4, Sun386i, SunInstall, SunOS, SunView, NFS, NeWS, and SPARC are trademarks of Sun Microsystems, Inc.

UNIX is a registered trademark of AT&T.

All other products or services mentioned in this document are identified by the trademarks or service marks of their respective companies or organizations.

CAUTION

This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a class A computing device in accordance with the specifications in Subpart J of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation.

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

CAUTION

There is a Lithium Battery molded into the Mostek *real-time clock*, Part Number MK48T02BU-25 or MK48T02B-XX, where X may be any number between 0-9. *This* is NOT a customer-replaceable part. The battery may explode if mistreated. Do not dispose of this component in fire. Do not disassemble it or attempt to recharge it.

Copyright © 1989 Sun Microsystems, Inc. – Printed in U.S.A.

All rights reserved. No part of this work covered by copyright hereon may be reproduced in any form or by any means – graphic, electronic, or mechanical – including photocopying, recording, taping, or storage in an information retrieval system, without the prior written permission of the copyright owner.

Restricted rights legend: use, duplication, or disclosure by the U.S. government is subject to restrictions set forth in subparagraph (c)(1)(ii) of the Rights in Technical Data and Computer Software clause at DFARS 52.227-7013 and in similar clauses in the FAR and NASA FAR Supplement.

The Sun Graphical User Interface was developed by Sun Microsystems Inc. for its users and licensees. Sun acknowledges the pioneering efforts of Xerox in researching and developing the concept of visual or graphical user interfaces for the computer industry. Sun holds a non-exclusive license from Xerox to the Xerox Graphical User Interface, which license also covers Sun's licensees.

Sun-3/80 Main Memory Expansion Module Installation Manual

1. Introduction

The following information provides installation instructions for the addition of memory to the Sun-3/80 Workstation. Please read all of the information before you expand the main memory by adding single in-line memory modules (SIMMs) to the central processing unit (CPU) board. Each SIMM provides 1 Mbyte of random access memory (RAM). Each Main Memory Expansion Module Kit contains four 1-Mbyte SIMM modules. Carefully follow every step of each procedure to ensure proper installation.

CAUTION

Do not open the conductive container until instructed to do so. Be sure to read the electrostatic discharge warning that follows.

Electrostatic Discharge Warning

SIMMs are made of delicate electronic components that are extremely sensitive to static electricity. Ordinary amounts of static from your clothes or work environment can destroy the modules. Handle the modules only by the edges. Do not touch the components themselves or any metal parts. Always wear an anti-static wrist strap when handling the modules.

Installation Kit

The Main Memory Expansion Module kit includes:

- SIMMs (4, 8, or 12 single in-line memory modules)
- Disposable anti-static mat
- Disposable anti-static wrist strap
- SIMM extraction tool

Tools Needed

A Phillips (cross-head) screwdriver is needed to complete the installation procedure in this manual.

2. Workstation Power Down

The operating system software must be halted before the workstation is turned off (powered-down). You may choose to perform the following procedures at a time when others cannot be affected.

CAUTION

Halting or stopping the operating system saves data in the computer buffers to the disk. If the operating system is not halted before the computer is powered-down, data in the computer buffers may be lost.

Use the following steps to halt SunOS (operating system) and power down your Sun-3/80 Workstation:

1. After becoming the root operator (super user), enter:

```
# sync
# sync
# /etc/halt
```

or enter:

```
# /etc/fasthalt
```

This procedure ensures that data in the buffers is written to disk before SunOS is halted.

2. When the ">" prompt appears, the equipment is ready for you to:

- Power the monitor OFF (press in the "O").
- If connected, power external storage device(s) OFF (press in the "O").
- Power the base unit OFF (press in the "O").

NOTE:

Do not disconnect the base unit AC power cord. The AC power cord provides the necessary grounding to install the SIMMs.

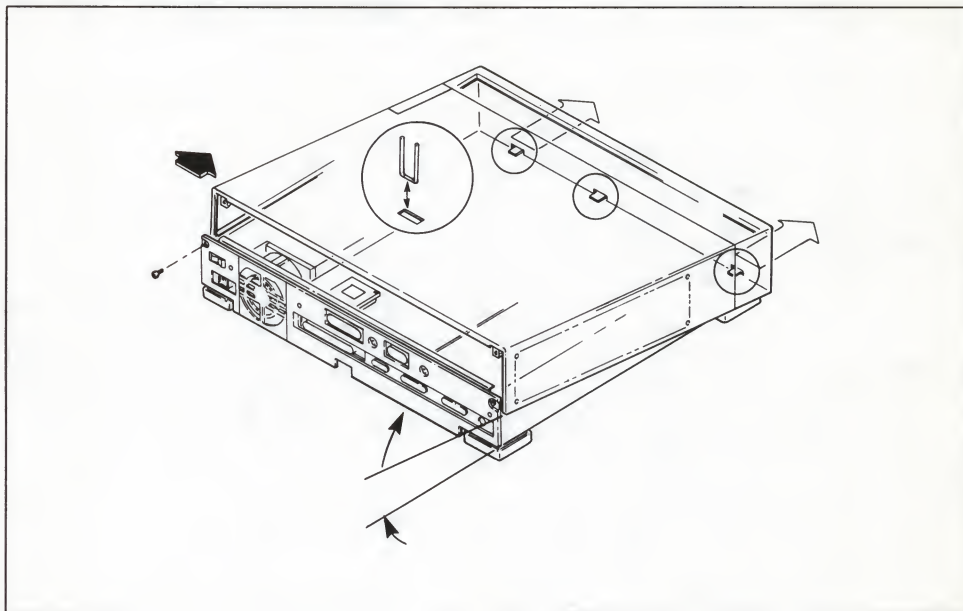
Removing the Cover

It may be necessary to remove other interconnecting cables attached to the base unit for this procedure. If you do disconnect any cables, be sure to label them first. **Remember, do not disconnect the base unit's AC power cord!** The Sun-3/80 Workstation's base unit also contains the printed circuit (PC) boards. The cover of the base unit must be removed to access these PC boards. Use the following steps to remove the cover:

CAUTION

Do not touch any components on the PC boards inside the chassis. Permanent damage to the components may occur.

1. Locate the two screws securing the cover to the chassis on the rear bezel of the unit.
2. Use a Phillips screwdriver to remove the two screws securing the cover to the chassis.
3. Tilt the cover upward about 15 degrees so the locking bracket inside clears the slot in the bottom of the chassis, and slide the cover off the base unit as shown in Figure 1.
4. Place the cover and screws aside so they can be used again later.

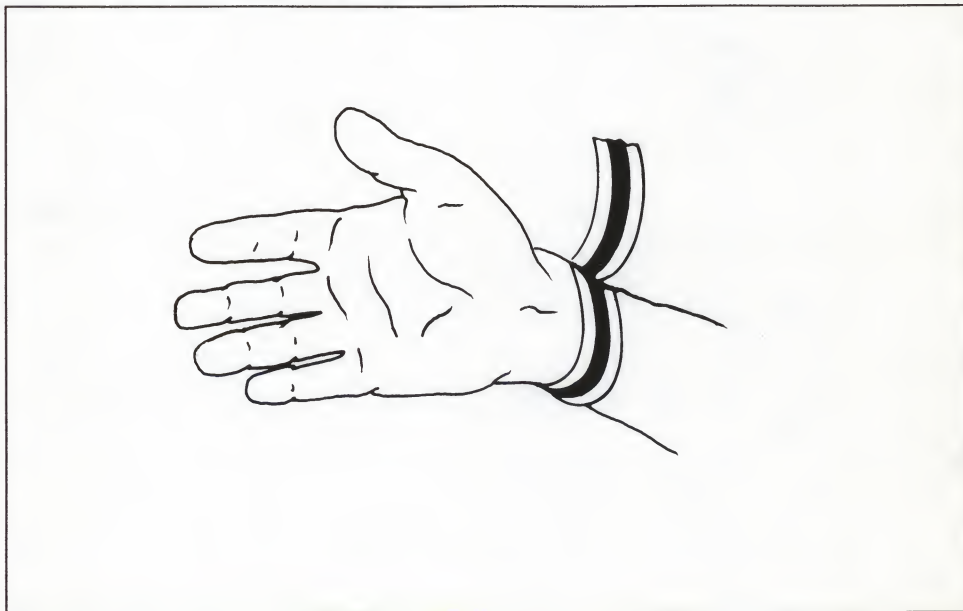
Figure 1 *Removing the Cover***Attaching the Wrist Strap**

The wrist strap grounds static electricity that might otherwise discharge on and damage components of the printed circuit boards.

CAUTION

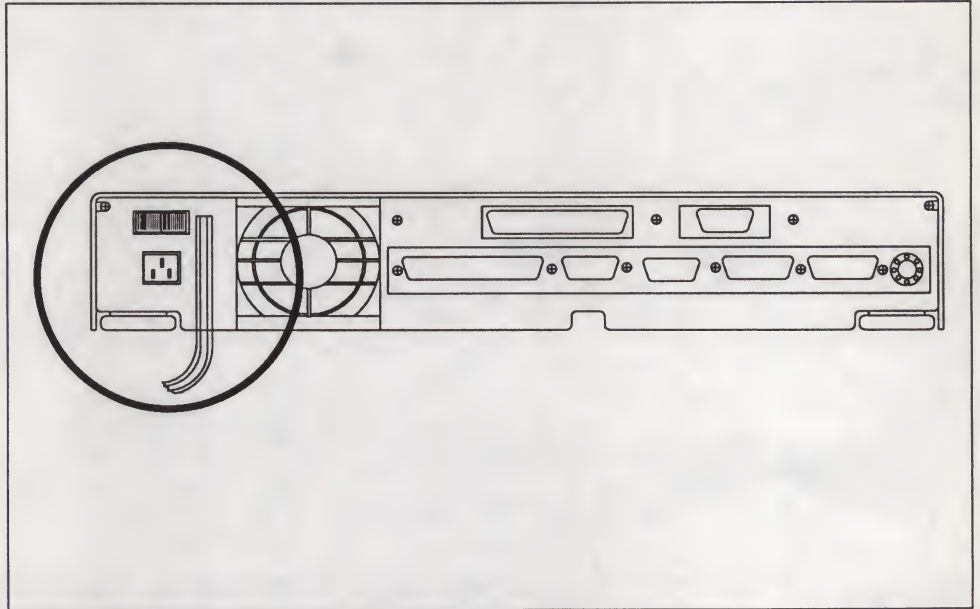
The anti-static wrist strap must be attached to your wrist and to a bare-metal portion of the workstation chassis before handling the SIMMs.

1. Wrap the end of the anti-static strap with the exposed black tape around your wrist as shown in Figure 2.

Figure 2 *Attaching the Anti-static Strap to Your Wrist*

2. Attach the end with the adhesive copper strip to an unpainted part of the chassis as shown in Figure 3.

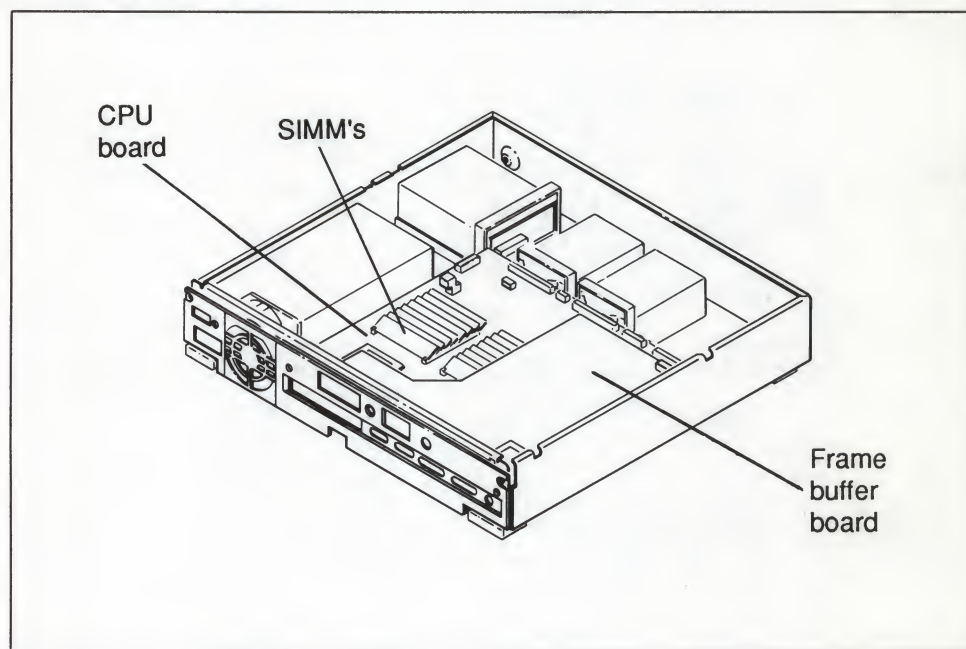
Figure 3 *Attaching the Anti-static Strap to the Chassis*



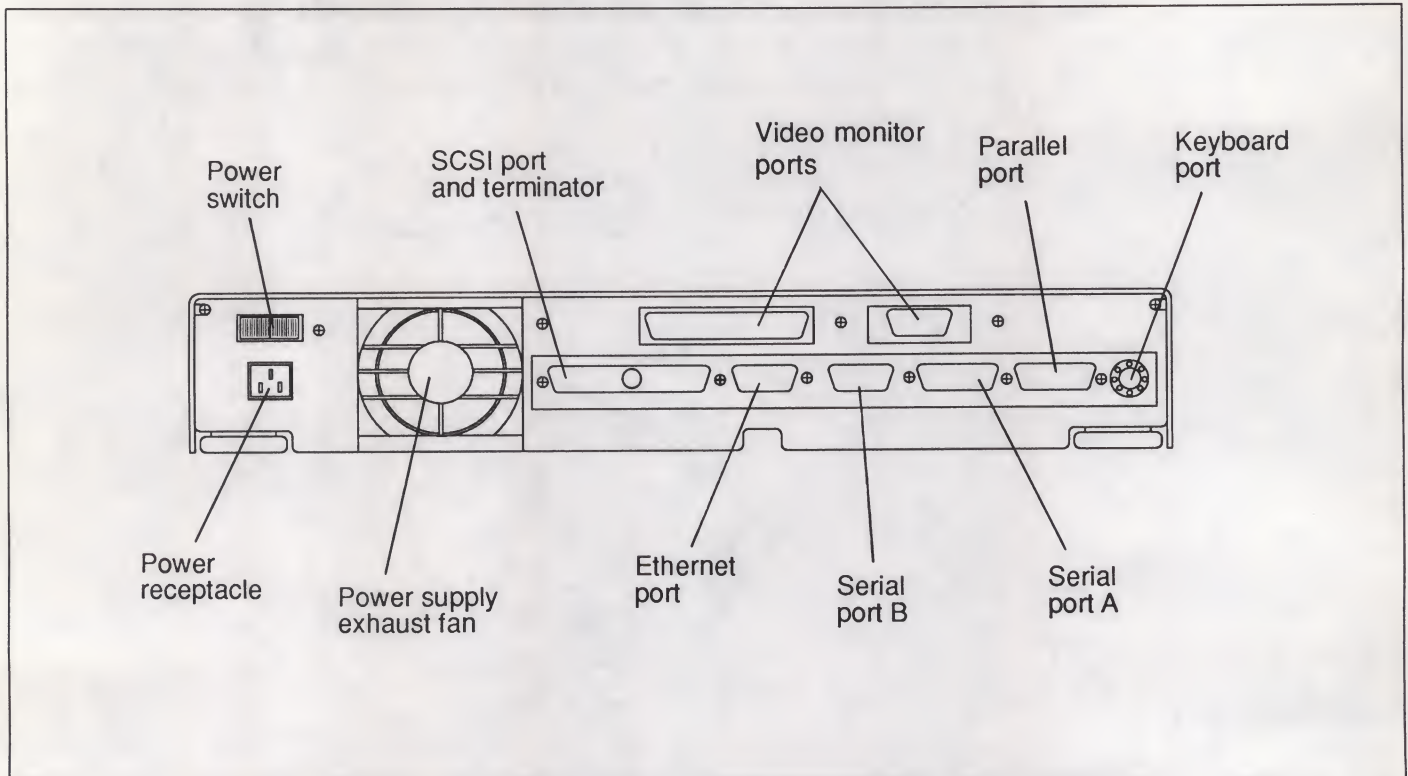
3. Chassis Preparation

With the base unit's cover removed, the layout of the subassembly parts and cables inside the chassis are visible as shown in Figure 4. The following steps prepare the chassis for the installation of a Bank of SIMMs (four modules). Always review and perform the appropriate steps in this section before beginning the installation process.

Figure 4 *Chassis Subassemblies*



1. Locate the two video monitor ports on the rear bezel of the base unit as shown in Figure 5.

Figure 5 *Rear Bezel Video Ports*

1. The CPU board must be completely visible to locate the SIMM sockets. If all of the SIMMs sockets are visible, skip this procedure.

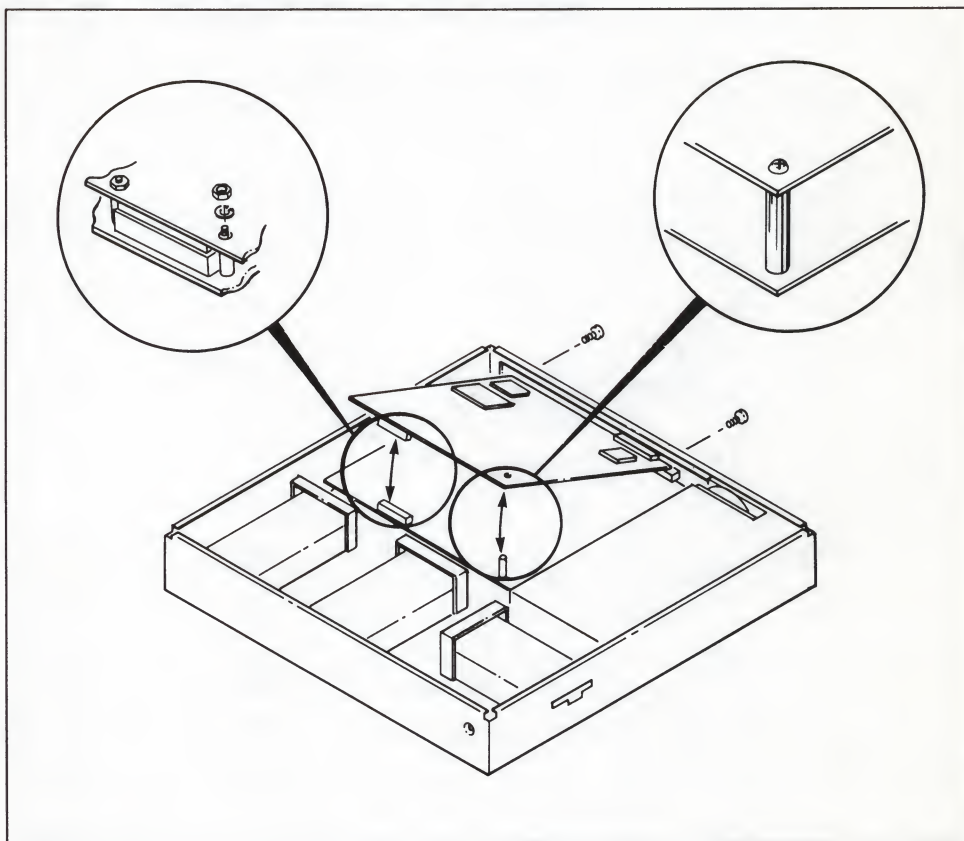
Removing a P4 Frame Buffer Board

When a P4 frame buffer board is covering one or more banks of SIMM sockets, use the steps that follow to remove the board and gain access to the sockets. If all of the SIMMs sockets are completely visible, skip this procedure.

1. Remove the video cable from the video port on the rear bezel of the base unit. You may wish to label and save the cable for a spare or reuse.
2. Remove the two Phillips screws on the rear bezel securing the frame buffer board to the chassis via the PC connector panel as shown in Figure 6. Place the two Phillips screws aside to use again later.
3. If present, remove the screw on the standoff separating the P4 frame buffer board from the CPU board below. Place the screw aside to use again later.
4. Place an anti-static mat, shiny side down, on a flat surface.

5. Locate the P4 (96-pin DIN) connector on the P4 frame buffer board, and remove the two lock nuts securing the P4 connector to the CPU board below.
6. Using two hands, grasp opposite sides of the P4 frame buffer board edges near the P4 connector, and gently lift up on one side and then the other until the P4 connector is freed from the CPU board below.
7. Slide the video port(s) out of the rear bezel while lifting the P4 frame buffer board up and out of the chassis.

Figure 6 *P4 Frame Buffer Board Removal and Installation*



8. Place the P4 frame buffer board on the anti-static mat.

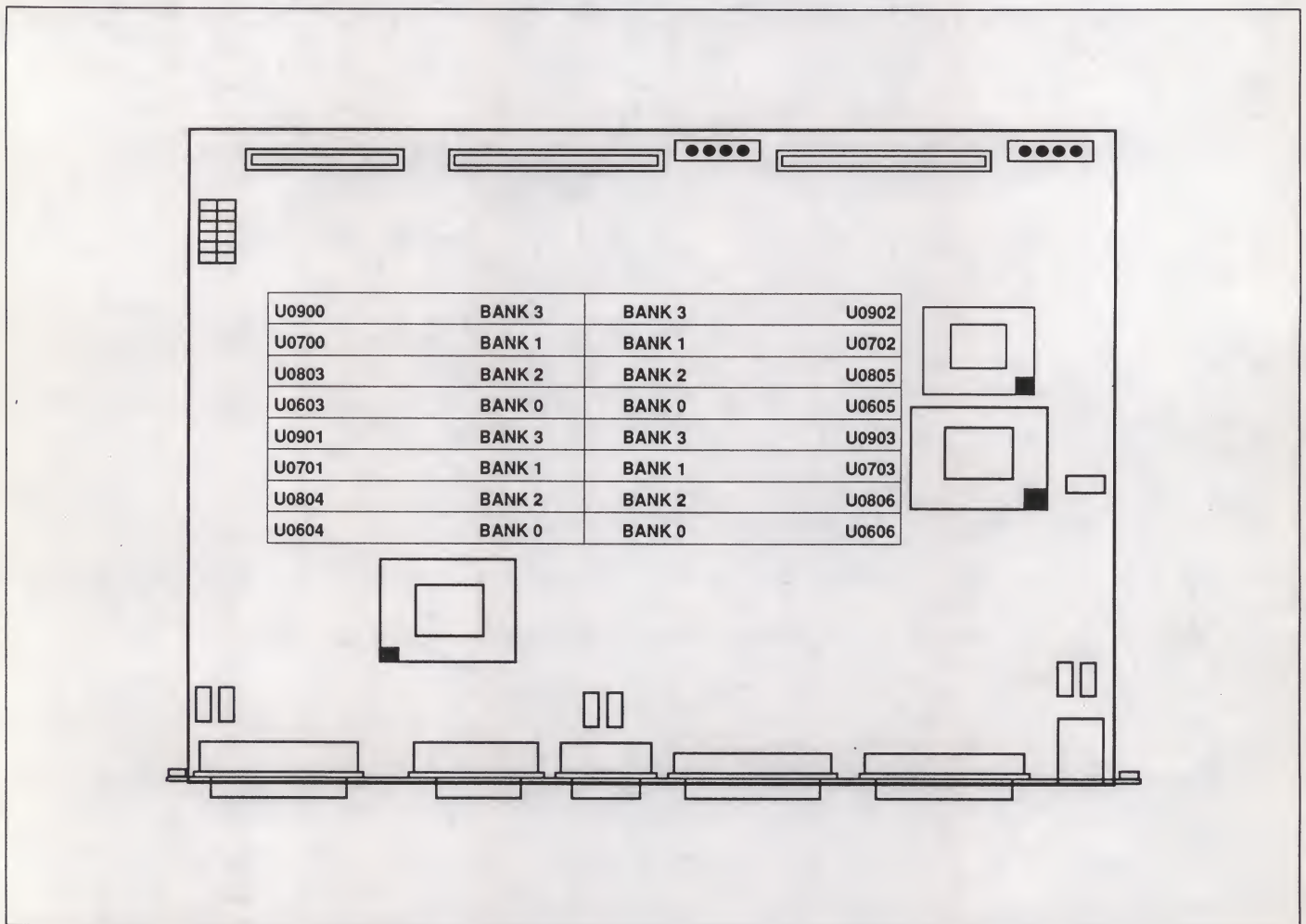
4. SIMM Installation

Because every CPU board has 16 SIMM sockets and a minimum of 4 Mbytes of memory (4 SIMMs), a maximum of 12 Mbytes of memory (12 SIMMs) can be added to the CPU board. Every set of four SIMM modules is installed in one of four Banks, numbered Bank 0 - Bank 3 (zero through three). When all four Banks of SIMMs sockets are completely visible, find the four sockets that make up Bank 0 (zero), Bank 1, Bank 2, and Bank 3 as shown in Figure 7.

The first Bank of SIMMs (Bank 0) is factory intalled in slot locations labeled U0603, U0604, U0605 and U0606. Install each additional set of four 1-Mbyte SIMM modules in the following order:

- U0700, U0701, U0702, and U0703 (Bank 1) for a total of 8 Mbytes
- U0803, U0804, U0805, and U0806 (Bank 2) for a total of 12 Mbytes
- U0900, U0901, U0902, and U0903 (Bank 3) for a total of 16 Mbytes.

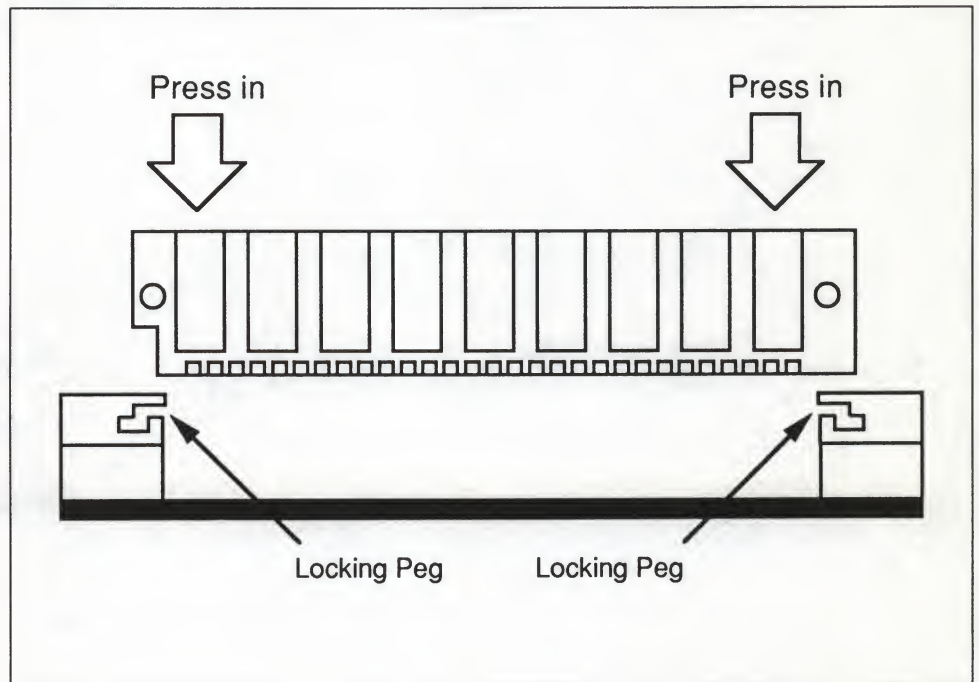
Figure 7 *SIMMs Bank 0 - Bank 3*



The steps that follow guide you through the installation of a Bank of SIMMs:

1. The SIMMs are packed inside the conductive container with a caution label on the outside. Peel back the caution label and remove each SIMM from the foam packing as you need it.
2. Holding a SIMM by the edges, slide it into the plastic guides tilted at a 45-degree angle. Insert the module into the next slot of Bank 1, Bank 2, or Bank 3 at a 45-degree angle as shown in Figure 8.
3. Place your thumbs on opposite corners of the SIMM and press firmly until the module snaps and locks into place.

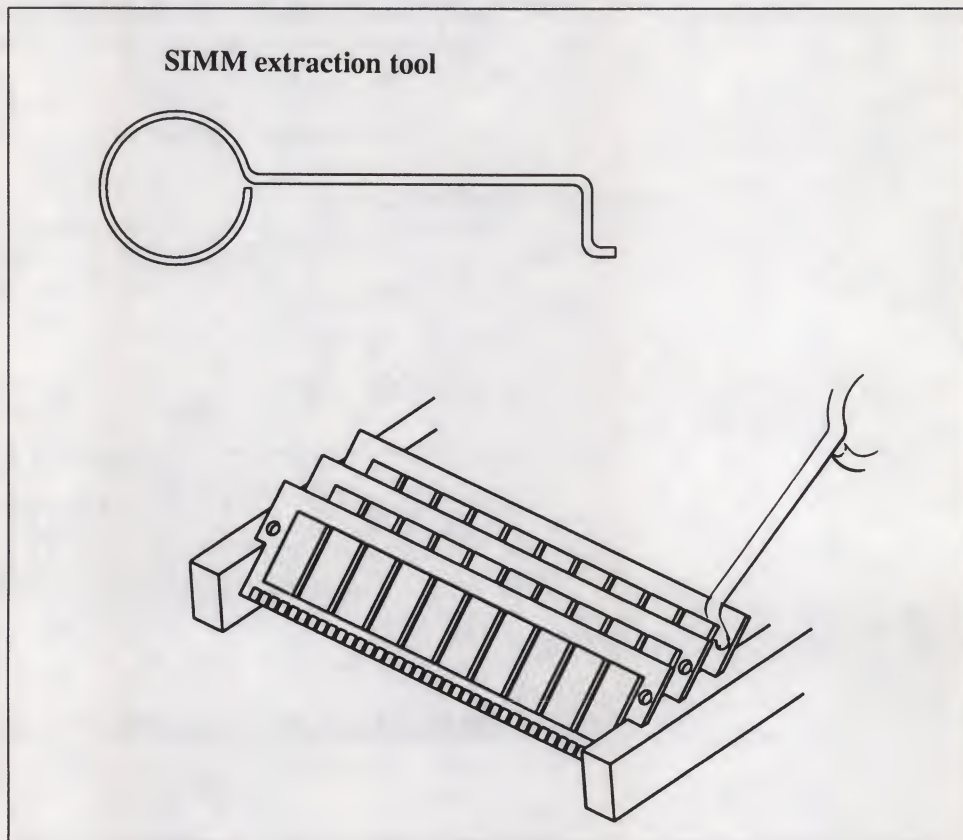
Figure 8 *Installing a SIMM*



Removing a SIMM

If necessary, you can remove a single SIMM or Bank of four SIMMs. To remove a module, use the SIMM extraction tool provided in your memory upgrade kit or a flat-head screwdriver. Depress the spring-loaded clips and then pull the module out as shown in Figure 9.

Figure 9 *Removing a SIMM with the Extraction Tool*



5. Reinstalling a P4 Frame Buffer Board

If you removed a P4 frame buffer board to gain access to the SIMMs on the CPU board, use the following steps to reinstall the P4 frame buffer board.

1. Locate the factory installed standoff on the CPU board as shown in Figure 6. If the standoff has a screw, remove the screw and place it aside for use later.

CAUTION

A standoff is used to prevent damage to the 8-bit color P4 frame buffer and CPU boards by keeping them apart. During normal operation, the CPU and P4 frame buffer boards should only come in contact via the P4 connector.

2. Holding the board by the edges, slide the video connector through the opening in the rear bezel of the base unit. Align the holes in the connector panel with the screw holes in the rear bezel.
3. Align the P4 connectors and standoff (if present) on the front of the CPU and the P4 frame buffer boards as shown in Figure 6.
4. Seat the P4 connector and standoff (if present) by placing one thumb on the P4 connector and one thumb on the standoff and pushing down firmly on one and then the other, until both snap into place.
5. Install one lock nut and washer at each end of the P4 connector securing the P4 frame buffer board to the CPU board below. If present, secure the standoff with its screw.
6. Using the two Phillips screws that you removed from the rear bezel, secure the PC board connector plate to the rear bezel.

6. Final Procedures

This section prepares the system for normal operation. Perform the following steps to prepare the Sun-3/80 Workstation and its peripheral equipment for normal operation.

1. Remove the anti-static wrist strap from your wrist and the chassis.
2. Return the cover to its proper position by aligning the three metal hooks on the chassis cover with the grooves on the front of the chassis and tilting the cover toward the rear bezel.
3. Align the locking bracket inside the cover with the slot in the base of the chassis as needed to close the cover.
4. Install the screws in the rear bezel. Use a Phillips screwdriver to tighten the screws securing the cover to the chassis.
5. Reinstall any interconnecting cables removed in previous steps.

CAUTION

Do not power up the base unit without replacing the cover and securing it. Failure to take this precaution could result in damage to the equipment.

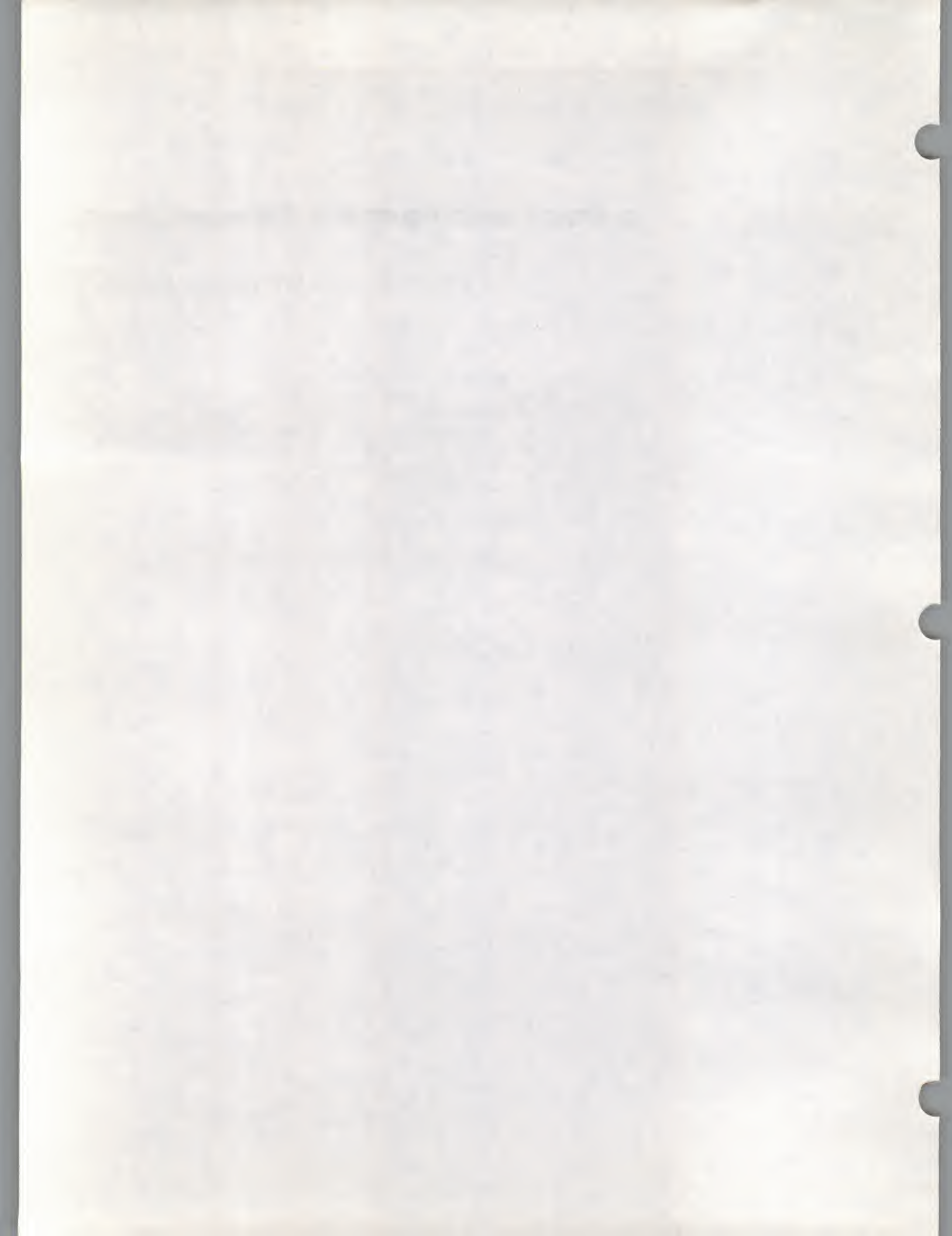
Workstation Power-Up

With the new SIMMs installed and the base unit cover secured, the equipment is ready for you to:

1. Power the monitor ON
(press in the "1").
2. If connected, power the external storage device(s) ON
(press in the "1").
3. Power the base unit ON
(press in the "1").

Revision History

Dash	Revision	Date	Comments
01	01	November 22, 1988	Alpha Review draft
02	50	January 9, 1989	Beta Review draft
05	A	May 1, 1989	Production Release



READER COMMENT SHEET

Dear Customer,

We who work at Sun Microsystems wish to provide the best possible documentation for our products. To this end, we solicit your comments on this manual. We would appreciate your telling us about errors in the content of the manual, and about any material that you feel should be there but isn't. Comments on the *Sun-3/80 Main Memory Expansion Module Installation Manual* (800-3237-05) are:

Typographical Errors

Please list typographical errors by page number and actual text of the error.

Technical Errors

Please list errors in technical accuracy by page number and actual text of the error.

Content

Did this guide meet your needs? If not, please indicate what you think should be added or deleted in order to do so. Please comment on any material that you feel should be present but is not. Is there material found in other manuals that would be more convenient if it were in this manual?

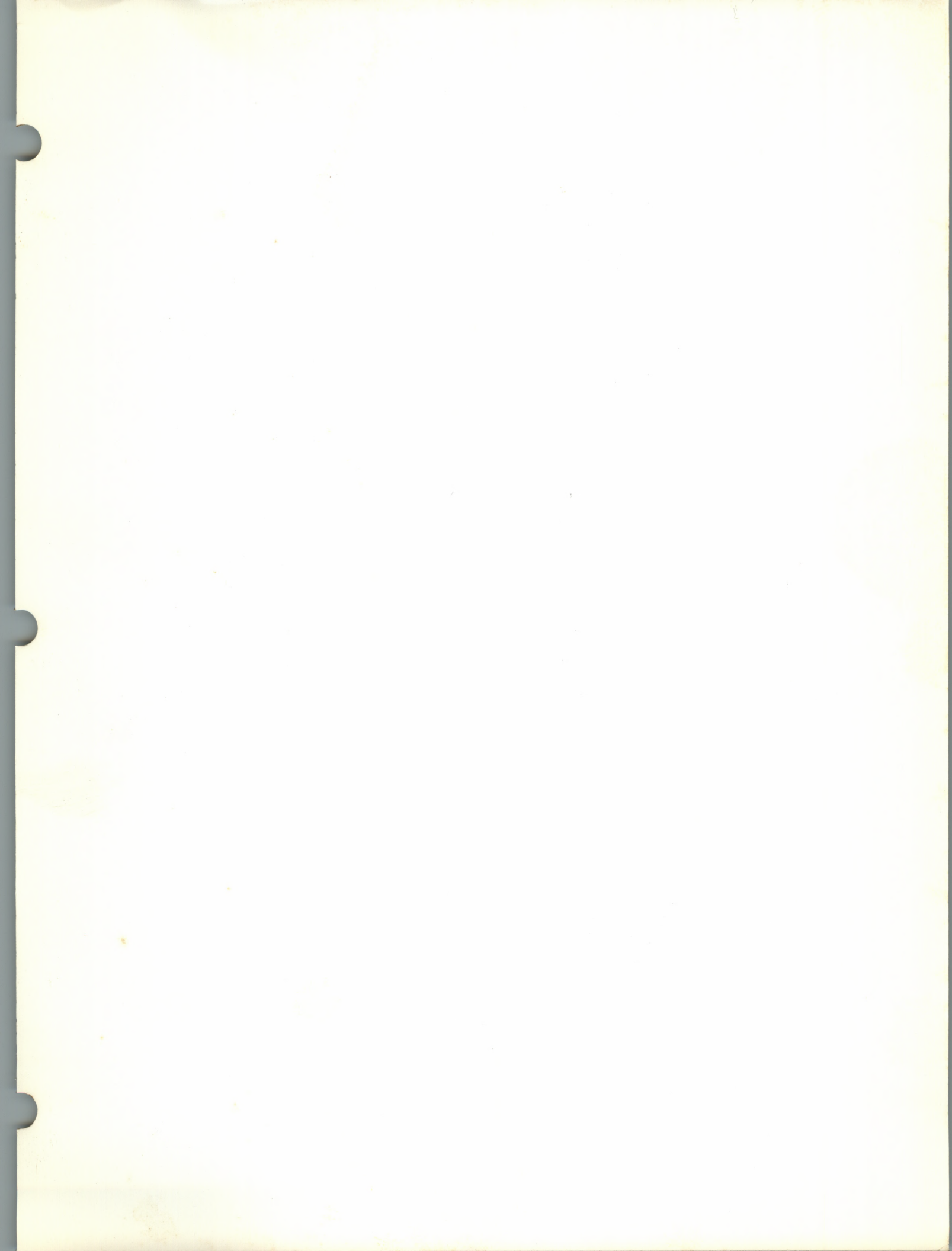
Layout and Style

Did you find the organization of this guide useful? If not, how would you rearrange things? Do you find the style of this manual pleasing or irritating? What would you like to see different?

Send comments to ⇒

Sun Microsystems, Inc., Attn. Technical Publications Mgr.
2550 Garcia Avenue, Mountain View, California 94043





Systems for Open Computing™

Corporate Headquarters

Sun Microsystems, Inc.
2550 Garcia Avenue
Mountain View, CA 94043
415 960-1300
TLX 37-29639

For U.S. Sales Office

locations, call:
800 821-4643
In CA: 800 821-4642

European Headquarters

Sun Microsystems Europe, Inc.
Bagshot Manor, Green Lane
Bagshot, Surrey GU19 5NL
England
0276 51440
TLX 859017

Australia: (02) 413 2666

Canada: 416 477-6745

France: (1) 40 94 80 00

Germany: (089) 95094-0

Hong Kong: 852 5-8651688

Italy: (39) 6056337

Japan: (03) 221-7021

Korea: 2-7802255

Nordic Countries: + 46 (0)8 7647810

PRC: 1-8315568

Singapore: 224 3388

Spain: (1) 2532003

Switzerland: (1) 8289555

The Netherlands: 3133501234

Taiwan: 2-7213257

UK: 0276 62111

Europe, Middle East, and Africa,
call European Headquarters:
0276 51440

Elsewhere in the world,
call Corporate Headquarters:
415 960-1300
Intercontinental Sales

